

PROJECT TITLE : TOBACCO STUDIES
PERIOD COVERED : MAY 1 - MAY 22 1981
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TOBACCO LOT ANALYSES

Introduction of Inputs on EDP

Partial analytical results of ten lots were introduced in the PME Analytical Data List.

Lots under Evaluation

Fifty-eight lots.

Lots available, but not yet analysed

Forty lots.

ASSISTANCE TO OTHER PROJECTS

SPOTLESS

We have received five samples of the B-TOT blend, each one with a different treatment: washed, washed + addition of fermented extract at different concentrations, washed + addition of different potassium salts.

REFERENCE CIGARETTES

Eight reference cigarettes were made this month: five with PRINCE blends that were processed differently, two with COMMONWEALTH blends and one with a COLORADO blend.

MISCELLANEOUS

Reconstituted Tobacco ex ITALY

We have received two samples of Italian reconstituted tobacco that is used in Diana. Because of difficulties encountered on the production cigarette maker, cigarettes must be handmade.

Blackfats

TLA cigarettes were handmade with two small samples of blackfat tobacco. The physical quality of the cigarettes was not very good due to the bad quality of the samples (cased loose leaves). After the equilibration of the cigarettes, we observed that the cigarette paper was stained with the casing.

Expanded Tobaccos ex Onnens

The TLA analyses of FC, CH and BUR blends before and after expansion are available. The main changes due to expansion are:

1) For the ET-FC blend we have (see Table 1):

a) per cigarette

- lower TA level (-34%)
- lower CO delivery (-26%)
- lower DPM delivery (-53%)
- lower SN delivery (-70%)
- lower puff count (-50%)
- lower HCN delivery (-21%)
- lower aldehyde delivery (-33%)

b) per gram of burnt tobacco

- higher CO delivery (+40%)
- lower SN delivery (-43%)
- slightly lower puff count
- very high HCN delivery (+53%)
- higher aldehyde delivery (+28%)

c) per puff

- higher CO delivery
- lower SN delivery
- higher HCN delivery
- higher aldehyde delivery

We also observe an increase of the CO/TAR ratio (+ 52%).

Table 1

Comparison of the FC blend before and after expansion (ETNA process).

ET-FC Blend	Lot 0707 before Expansion	Lot 0707 after Expansion	Comments
Tobacco Weight (mg/cig)	853	444	
RTD (mm H ₂ O)	98	150	
Firmness (mm)	5.43 at 13.6% m.c.	3.83 at 11.3% m.c.	
Cylinder Volume (ml/10 g)	32.1 at 11.6% m.c.	73.1 at 10.0% m.c.	
TA (%)	2.06	1.36	- 34% reduction
RS (%)	19.9	15.1	- 24% reduction
NO ₃ -N (%)	0.00	0.00	
Chloride (%)	0.44	0.45	
Ash (%)	10.1	10.6	
<u>Smoke Analyses</u>			
CO (mg/cig)	17.0 (22.8)	12.5 (32.1)	- 26% (+ 40%) reduction (increase)
NO (mg/cig)	0.06 (0.08)	0.03 (0.08)	
DPM (mg/cig)	25.0 (33.5)	11.8 (30.3)	- 53% reduction
SN (mg/cig)	1.85 (2.48)	0.55 (1.41)	- 70% (- 43%) reduction
Puff (puff/cig)	11.5 (15.4)	5.7 (14.7)	- 50% reduction
HCN (µg/cig)	257 (344)	204 (525)	- 21% (+ 53%) reduction (increase)
Ald (mg/cig)	1.86 (2.49)	1.24 (3.19)	- 33% (+ 28%) reduction (increase)
CO/TAR	0.73	1.11	+ 52% increase

The values in parentheses are calculated per gram of burnt tobacco.

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2) For the ET-CH blend we have (see Table 2):

a) per cigarette

- lower TA level (-12%)
- higher NO₃-N level (+16%)
- lower NH₃-N level (-33%)
- lower CO₃ delivery (-28%)
- lower NO delivery (-25%)
- lower DPM delivery (-33%)
- lower SN delivery (-58%)
- higher HCN delivery (+24%)
- lower aldehydes delivery (-10%)
- lower puff count (-40%)

b) per gram of burnt tobacco

- higher CO delivery (+18%)
- higher NO delivery (+22%)
- lower SN delivery (-32%)
- very high HCN delivery (+102%)
- higher aldehydes delivery (+47%)

c) per puff

- slightly higher CO delivery
- higher NO delivery
- lower SN delivery
- higher HCN delivery
- higher aldehydes delivery

We notice a slightly higher CO/TAR ratio (+ 7%).

Table 2

Comparison of CH blend before and after expansion in the ETNA process.

ET-CH Blend	Lot 0801 before Expansion	Lot 0801 after Expansion	Comments
Tobacco Weight (mg/cig)	687	420	
RTD (mm H ₂ O)	116	146	
Firmness (mm)	2.79 at 10.7% m.c.	2.32 at 10.4% m.c.	
Cylinder Volume (ml/10 g)	53.4 at 9.8% m.c.	89.3 at 9.3% m.c.	
TA (%)	0.83	0.73	- 12% reduction
RS (%)	0.6	0.3	
NH ₃ -N (%)	0.66	0.44	- 33% reduction
NO ₃ -N (%)	0.25	0.29	+ 16% increase
Chloride (%)	0.34	0.39	
Ash (%)	19.4	19.8	
<u>Smoke Analyses</u>			
CO (mg/cig)	19.9 (33.1)	14.4 (39.1)	- 28% reduction (+ 18% increase)
NO (mg/cig)	0.35 (0.58)	0.26 (0.71)	- 25% reduction (+ 22% increase)
DPM (mg/cig)	20.4 (33.9)	13.6 (37.0)	- 33% reduction
SN (mg/cig)	0.89 (1.48)	0.37 (1.01)	- 58% (-32%) reduction
Puff (puff/cig)	7.8 (13.0)	4.7 (12.8)	- 40% reduction
HCN (µg/cig)	217 (361)	268 (729)	+ 24% (+ 102%) increase
Ald (mg/cig)	1.68 (2.79)	1.51 (4.11)	- 10% reduction (+ 47% increase)
CO/TAR	1.02	1.09	+ 7% increase

The values in parentheses are calculated per gram of burnt tobacco.

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3) For the ET-BU blend we have (see Table 3):

a) per cigarette

- lower TA level (-21%)
- lower NH_3 -N level (-40%)
- lower CO delivery (-31%)
- lower NO delivery (-56%)
- lower DPM delivery (-53%)
- lower SN delivery (-74%)
- lower puff count (-53%)
- lower aldehydes delivery (-28%)

b) per gram of burnt tobacco

- higher CO delivery (+48%)
- lower SN delivery (-45%)
- higher HCN delivery (+106%)
- higher aldehydes delivery (+54%)

c) per puff

- higher CO delivery
- lower SN delivery
- higher HCN delivery
- higher aldehydes delivery.

We observe a higher CO/TAR ratio (+ 39%).

Table 3

Comparison of BUR blend before and after expansion in the ETNA process.

ET-BU Blend	Lot 0900 before Expansion	Lot 0900 after Expansion	Comments
Tobacco Weight (mg/cig)	886	414	
RTD (mm H ₂ O)	147	184	
Firmness (mm)	2.16 at 12.3% m.c.	2.17 at 11.0% m.c.	
Cylinder Volume (ml/10 g)	50.5 at 10.5% m.c.	112.5 at 9.8% m.c.	+ 116% increase
TA (%)	2.34	1.85	- 21% reduction
RS (%)	1.5	1.1	
NO ₃ -N (%)	0.46	0.47	
NH ₃ -N (%)	0.57	0.34	- 40% reduction
<u>Smoke Analyses</u>			
CO (mg/cig)	17.3 (22.3)	12.0 (33.1)	- 31% reduction (+ 48% increase)
NO (mg/cig)	0.59 (0.76)	0.26 (0.72)	- 56% reduction
DPM (mg/cig)	19.2 (24.8)	9.1 (25.1)	- 53% reduction
SN (mg/cig)	1.84 (2.37)	0.47 (1.30)	- 74% (- 45% reduction)
Puff (puff/cig)	10.0 (12.9)	4.7 (13.0)	- 53% reduction
HCN (µg/cig)	196 (253)	189 (521)	(+ 106% increase)
Ald (mg/cig)	1.33 (1.72)	0.96 (2.65)	- 28% reduction (+ 54% increase)
CO/TAR	1.00	1.39	+ 39% increase

The values in parentheses are calculated per gram of burnt tobacco.

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For all kinds of ETNA, the observed reductions of the deliveries per cigarette are obviously due to the reduction of the tobacco weight. We have also a greater SN reduction than would be expected only from the tobacco weight reduction. This is due to the TA loss during the expansion process.

The only really surprising results are the HCN values: we observe a very large increase per gram of burnt tobacco. To a lesser extent there is an increase in the $\text{NO}_3\text{-N}$ and NO values for the ET-CH blend.

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